

REMARKS

Applicant has carefully reviewed and considered the Office Action mailed on June 1, 2007, and the references cited therewith. Claims 1, 9, and 10 are amended. The amendments is found, for example at page 8, line 24 to page 9, line 17; and at page 3, lines 22 to 27.

Section 112 Rejection of the Claims

Claim 9 was rejected under 35 USC Section 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicants have amended claim 9 to clarify that the units for Melt Flow Index are the standard "g/10 min".

Section 102 Rejection of the Claims

Claims 1-2, 4-11, 13-16 and 42-43 were rejected under 35 USC Section 102(b) as being anticipated by Radovanovic et al. (WO 00/09597 A1).

Applicants have amended independent claims 1 and 10 such that they now claim, in the case of claim 1, a shaped article comprising a) polyvinylidene fluoride or copolymers thereof; a sufficient quantity of nanometer-sized nucleating agent to initiate crystallization of the polyvinylidene fluoride or copolymers thereof at a significantly greater number of crystallization sites as compared to crystallization without the nucleating agent; and c) glyceryl triacetate; wherein the shaped article is microporous and has been oriented in at least one direction at a stretch ratio of at least approximately 1.1 to 1.0; and wherein the sufficient quantity of nucleating agent is between approximately 0.2 percent to approximately 2.5 percent by weight of the polyvinylidene fluoride or copolymers thereof.

In the case of claim 10, the invention is directed to a shaped article comprising a) polyvinylidene fluoride or copolymers thereof; b) a sufficient quantity of nanometer-sized nucleating agent to initiate crystallization of the polyvinylidene fluoride or copolymers thereof at a significantly greater number of crystallization sites as compared to crystallization without the nucleating agent; c) a diluent with which the polyvinylidene fluoride or copolymers thereof are miscible, and in which the polyvinylidene fluoride or copolymers thereof will dissolve at or above the melting temperature of the polyvinylidene fluoride or copolymers thereof, and will

phase separate upon cooling to a temperature at or below the crystallization or phase separation temperature of the polyvinylidene fluoride or copolymers thereof; wherein the shaped article is microporous and has been oriented in at least one direction at a stretch ratio of at least approximately 1.1 to 1.0; and wherein the sufficient quantity of nucleating agent is between approximately 0.2 percent to approximately 2.5 percent by weight of the polyvinylidene fluoride or copolymers thereof.

Applicants have discovered that nanometer-sized particles of nucleating agents, such as polytetrafluoroethylene (PTFE), successfully nucleate PVDF. PTFE had previously been used to produce dense, non-porous PVDF films in contrast to the microporous films of the present invention. Radovanovic does not teach the use of nanometer-sized particles, as required in the pending claims. Furthermore, Applicant believes the creation of PVDF films using a TIPS process wherein glyceryl triacetate is the diluent is a non-obvious improvement over Radovanovic. As noted at page 6, lines 22 to 31 of the application as published, glyceryl triacetate, in addition to functioning as a diluent for PVDF in TIPS processes, also has additional advantages related to its non-hazardous nature. Glyceryl triacetate has been previously used as a food additive and is therefore non-toxic. The glyceryl triacetate can remain in the film or be removed either partially or almost completely. Glyceryl triacetate can readily be removed from PVDF microporous membranes using water as a solvent. Additionally, the by-products or effluents are glycerol and acetic acid, both of which are also non-toxic and sewerable. Furthermore, there are considerable economic and environmental advantages to not requiring or producing organic solvents that must be disposed of during the removal process.

In view of the facts that Radovanovic does not teach every element of the pending claims, Applicants believe Radovanovic to be an improper basis for rejecting the pending claims under 35 U.S.C. Section 102.

Section 103 Rejection of the Claims

Claims 3 and 12 were rejected under 35 USC Section 103(a) as being unpatentable over Radovanovic et al. as applied to claims 2 and 11 as shown above in view of Schneider et al. (the article entitled "Self-Nucleation and Enhanced Nucleation of Polyvinylidene Fluoride (α -phase)"). As asserted above, the presently claimed invention requires both the use of glyceryl

triacetate, as well as the use of nanometer-sized particles as the nucleating agent. Neither of which is disclosed or made obvious by the combination of Radovanovic and Schneider.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (612-746-4783) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 50-3688.

Respectfully submitted,

SAMANTHA D. SMITH ET AL.

By their Representatives,

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